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ORIGINAL ARTICLE

Evaluation of Tetracycline Antibiotic Residue in Honey Samples using ELISA and HPLC

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KEYWORDS

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ABSTRACT: Honey is used worldwide due to its medicinal and nutritional properties. Antibiotics are used to treat diseases such as American foulbrood and European foulbrood or as a drug for preventing disease in the beehives. Antibiotic residues should be carefully monitored because they can have adverse effects on the general health of human. In this study, the amount of tetracycline residue was measured in honey samples. A total of 80 honey samples were collected from different regions of Qazvin province, Iran. The methods used included enzyme-linked immunosorbent (ELISA) assay and high-performance liquid chromatography (HPLC). ELISA method showed that the maximum and minimum levels of tetracycline residue were 40 ppb and 1.26 ppb, respectively. The areas with values above the kit's LOD include Takestan (14.28%), Abeyek (4.76%), and Alamot-e-gharbi (4.54%), respectively. In the Alamot-e-sharghi samples, the antibiotic values above the kit's LOD were not found. Samples with values above the kit's LOD in ELISA method were measured using HPLC method. According to ELISA results, of the 80 honey samples, 4 samples (5%) had antibiotic more than the highest LOD of the kit. These 4 samples were tested using HPLC method. The results of HPLC showed that out of 4 honey samples, one sample was more than 40 ppb, but 3 samples were less than 40 ppb. There is a significant difference between ELISA and HPLC ($p < 0.05$). If the antibiotic residue levels of tetracycline are too high in food, it can cause serious harm to the health of consumers, therefore, monitoring of antibiotics residue in food is very necessary.

INTRODUCTION

Honey has medicinal and nutritional properties and is therefore widely used by consumers [1]. In human history for a long time, honey was the only sweetener and important source of carbohydrate until industrial sugar took its place [2]. Honey is rich in nutrients and used worldwide, however, due to honey is produced in a natural environment it maybe contaminate by various natural substances [3]. Annual production of honey is

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